

WHAT IS CLAIMED IS:

1. An absorption belt capable of absorbing an object, comprising:
- 5 a base layer;  
an insulating layer on said base layer;  
a plurality of electrodes arranged alternately with positive and negative with respect to said insulating layer;  
and
- 10 a plurality of absorption layers for covering each of said electrodes, at least two of said absorption layers having different volume resistivities, said plurality of absorption layers including a first absorption layer directly disposed on said plurality of electrodes and a
- 15 second absorption layer disposed above said first absorption layer, said second absorption layer having a volume resistivity  $R_{a2}$  smaller than a volume resistivity  $R_{a1}$  of said first absorption layer, a volume resistivity of a resin which is a main ingredient of said second
- 20 absorption layer before a control of resistance being  $1.0 \times 10^{16} \Omega \cdot \text{cm}$  or less.

2. An absorption belt capable of absorbing an object, comprising:
- 25 a base layer;  
an insulating layer on said base layer;  
a plurality of electrodes arranged alternately with

positive and negative with respect to said insulating layer;  
and

a plurality of absorption layers for covering each  
of said electrodes, at least two of said absorption layers  
5 having different volume resistivities and including a first  
absorption layer directly disposed on said plurality of  
electrodes and a second absorption layer disposed above  
said first absorption layer, said second absorption layer  
having a volume resistivity Ra2 smaller than a volume  
10 resistivity Ra1 of said first absorption layer, an uppermost  
layer of said absorption layers including a fluoride resin.

3. The absorption belt according to claim 1,  
wherein said volume resistivity Ra1 of said first absorption  
15 layer directly disposed on each of said electrodes is within  
the range of  $1.0 \times 10^{11} \Omega \cdot \text{cm}$  -  $1.0 \times 10^{14} \Omega \cdot \text{cm}$ , and said  
volume resistivity Ra2 of said second absorption layer  
disposed above said first absorption layer is within the  
range of  $1.0 \times 10^8 \Omega \cdot \text{cm}$  -  $1.0 \times 10^{12} \Omega \cdot \text{cm}$ , and wherein said  
20 volume resistivity Ra1 is larger than said volume  
resistivity Ra2 ( $\text{Ra1} > \text{Ra2}$ ).

4. The absorption belt according to claim 2,  
wherein said volume resistivity Ra1 of said first absorption  
25 layer directly disposed on each of said electrodes is within  
the range of  $1.0 \times 10^{11} \Omega \cdot \text{cm}$  -  $1.0 \times 10^{14} \Omega \cdot \text{cm}$ , and said  
volume resistivity Ra2 of said second absorption layer

disposed above said first absorption layer is within the range of  $1.0 \times 10^8 \Omega \cdot \text{cm}$  -  $1.0 \times 10^{12} \Omega \cdot \text{cm}$ , and wherein said volume resistivity  $R_{a1}$  is larger than said volume resistivity  $R_{a2}$  ( $R_{a1} > R_{a2}$ ).

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5. The absorption belt according to claim 3, wherein a volume resistivity  $R_i$  of said insulating layer positioned between said electrodes is  $1.0 \times 10^{13} \Omega \cdot \text{cm}$  or more, and a volume resistivity  $R_b$  of said base layer is within the range of  $1.0 \times 10^{11} \Omega \cdot \text{cm}$  -  $1.0 \times 10^{13} \Omega \cdot \text{cm}$ , and wherein the relationship that  $R_i \geq R_b > R_{a1} > R_{a2}$  is satisfied.

6. The absorption belt according to claim 4, wherein a volume resistivity  $R_i$  of said insulating layer positioned between said electrodes is  $1.0 \times 10^{13} \Omega \cdot \text{cm}$  or more, and a volume resistivity  $R_b$  of said base layer is within the range of  $1.0 \times 10^{11} \Omega \cdot \text{cm}$  -  $1.0 \times 10^{13} \Omega \cdot \text{cm}$ , and wherein the relationship that  $R_i \geq R_b > R_{a1} > R_{a2}$  is satisfied.

20 7. A method for producing an absorption belt capable of absorbing an object, comprising the steps of:

(a) winding a base layer sheet on a core member so that the both ends of said base layer sheet overlap with each other;

25 (b) winding an insulating layer sheet on said base layer sheet, said insulating layer sheet having a plurality of openings;

(c) disposing an electrode sheet with respect to each of said openings of said insulating layer sheet;

(d) winding a first sheet for an absorption layer on said insulating layer sheet so that the both ends of said first sheet overlap with each other and each electrode sheet is covered with said first sheet;

(e) winding a second sheet for said absorption layer on said first sheet so that the both ends of said second sheet overlap with each other, said second sheet having a volume resistivity  $R_{a2}$  smaller than a volume resistivity  $R_{a1}$  of said first sheet, a volume resistivity of a resin which is a main ingredient of said second sheet before a control of resistance being  $1.0 \times 10^{16} \Omega \cdot \text{cm}$  or less;

(f) covering a circumferential surface of said second sheet with a cylindrical member; and

(g) thermally joining adjacent sheets and said overlapped portions.

8. A method for producing an absorption belt capable of absorbing an object, comprising the steps of:

(a) winding a base layer sheet on a core member so that the both ends of said base layer sheet overlap with each other;

(b) winding an insulating layer sheet on said base layer sheet, said insulating layer sheet having a plurality of openings;

(c) disposing an electrode sheet with respect to

each of said openings of said insulating layer sheet;

(d) winding first sheet for an absorption layer on said insulating layer sheet so that the both ends of said first sheet overlap with each other and each electrode sheet  
5 is covered with said first sheet;

(e) winding a second sheet for said absorption layer on said first sheet so that the both ends of said second sheet overlap with each other, said second sheet having a volume resistivity  $R_{a2}$  smaller than a volume resistivity  
10  $R_{a1}$  of said first sheet, said second sheet including a fluoride resin;

(f) covering a circumferential surface of said second sheet with a cylindrical member; and

(g) thermally joining adjacent sheets and said  
15 overlapped portions.

9. A method for producing an absorption belt capable of absorbing an object, comprising the steps of:

(a) winding a base layer sheet on a core member so  
20 that the both ends of said base layer sheet overlap with each other;

(b) winding an insulating layer sheet on said base layer sheet, said insulating layer sheet having a plurality of openings;

25 (c) disposing an electrode sheet with respect to each of said openings of said insulating layer sheet;

(d) winding first sheet for an absorption layer on

said insulating layer sheet so that the both ends of said first sheet overlap with each other and each electrode sheet is covered with said first sheet;

(e) winding a second sheet for said absorption layer  
5 on said first sheet so that the both ends of said second sheet overlap with each other, said second sheet having a volume resistivity  $R_{a2}$  smaller than a volume resistivity  $R_{a1}$  of said first sheet;

(f) covering a circumferential surface of said  
10 second sheet with a cylindrical member; and

(g) thermally joining adjacent sheets and said overlapped portions.

10. The method according to claim 9, wherein the  
15 relationship that  $R_i \geq R_b > R_{a1} > R_{a2}$  is satisfied where  $R_i$  is a volume resistivity of said insulating layer sheet and  $R_b$  is a volume resistivity of said base layer sheet.

11. An absorption belt having an absorption surface  
20 and capable of absorbing an object on said absorption surface, comprising:

an insulating layer;

a plurality of electrodes arranged alternately with  
positive and negative with respect to said insulating layer  
25 at a predetermined interval; and

an absorption layer disposed on each of said electrodes  
and having a volume resistivity different from a volume

resistivity of said insulating layer;

wherein said insulating layer and said absorption layer appear alternately on said absorption surface.

5           12. The absorption belt according to claim 11, wherein said volume resistivity of said absorption layer is smaller than that of said insulating layer.

10           13. The absorption belt according to claim 11, wherein said volume resistivity of said absorption layer is within the range of  $1.0 \times 10^8 \Omega \cdot \text{cm}$  -  $1.0 \times 10^{14} \Omega \cdot \text{cm}$ , and wherein said volume resistivity of said insulating layer is  $1.0 \times 10^{13} \Omega \cdot \text{cm}$  or more.

15           14. An image forming apparatus for forming an image on a printing medium, comprising the absorption belt according to claim 11 as a means for transferring said printing medium.

20           15. A method for producing an absorption belt capable of absorbing an object, comprising the steps of:

            (a) winding a base layer sheet on a core member so that the both ends of said base layer sheet overlap with each other;

25           (b) winding an insulating layer sheet on said base layer sheet, said insulating layer sheet having a plurality of openings;

(c) disposing an electrode sheet with respect to each of said openings of said insulating layer sheet;

(d) disposing an absorption layer sheet for covering each electrode sheet with respect to each of said openings  
5 of said insulating layer sheet;

(e) covering a circumferential surface of said insulation layer sheet with a cylindrical member; and

(f) thermally joining adjacent sheets and said overlapped portions.

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16. The method according to claim 15, wherein the relationship that  $R_i \geq R_b > R_a$  is satisfied where  $R_b$  is a volume resistivity of said base layer sheet,  $R_i$  is a volume resistivity of said insulating layer sheet and  $R_a$  is a volume  
15 resistivity of said absorption layer sheet.

17. An absorption belt having an absorption surface and capable of absorbing an object on said absorption surface, comprising:

20 an insulating layer;

a plurality of electrodes arranged alternately with positive and negative with respect to said insulating layer at a predetermined interval; and

an absorption layer disposed on each of said electrodes  
25 and having a volume resistivity smaller than a volume resistivity of said insulating layer; and

an under-electrode layer disposed under each of said



electrodes and having a volume resistivity smaller than that of said insulating layer but larger than that of said absorption layer;

5 wherein said insulating layer and said absorption layer appear alternately on said absorption layer, and wherein said insulating layer and said under-electrode layer appear alternately on the opposite surface of said absorption surface.

10 18. The absorption belt according to claim 17, wherein said volume resistivity of said absorption layer is within the range of  $1.0 \times 10^8 \Omega \cdot \text{cm}$  -  $1.0 \times 10^{12} \Omega \cdot \text{cm}$ , said volume resistivity of said under-electrode layer is within the range of  $1.0 \times 10^{10} \Omega \cdot \text{cm}$  -  $1.0 \times 10^{14} \Omega \cdot \text{cm}$ , and  
15 said volume resistivity of said insulating layer is  $1.0 \times 10^{13} \Omega \cdot \text{cm}$  or more.

19. An image forming apparatus for forming an image on a printing medium, comprising the absorption belt  
20 according to claim 17 as a means for transferring said printing medium.

20. A method for producing an absorption belt capable of absorbing an object, comprising the steps of:  
25 (a) providing an insulating layer sheet having a plurality of openings and disposing an under-electrode layer sheet, an electrode sheet and an absorption layer

sheet in each of said openings of said insulating layer sheet in turn;

(b) temporarily fixing adjacent sheets to each other;

5 (c) winding said insulating layer sheet on a core member so that the both ends of said insulating layer sheet overlap with each other;

(d) covering a circumferential surface of said insulating layer sheet with a cylindrical member; and

10 (e) thermally joining adjacent sheets and said overlapped portion.

21. The method according to claim 20, wherein said volume resistivities of said sheets are selected so that  
15 the relationship that  $R_i \geq R_l > R_a > R_e$  is satisfied where  $R_i$  is a volume resistivity of said insulating layer sheet,  $R_l$  is a volume resistivity of said under-electrode layer sheet,  $R_e$  is a volume resistivity of said electrode sheet,  $R_a$  is a volume resistivity of said absorption layer sheet.

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22. An absorption belt capable of absorbing an object, comprising:

an insulating layer;

a plurality of electrodes arranged alternately with  
25 positive and negative with respect to said insulating layer;  
and

a plurality of feeding terminals, each of said feeding

terminals connected with each of said electrodes and disposed on the side of one of longitudinal edges of said belt, said feeding terminals for feeding positive voltage extending towards one of a surface or a back of said belt, 5 said feeding terminals for feeding negative voltage extending towards the other of said surface or said back of said belt.

23. An image forming apparatus for forming an image 10 on a printing medium, comprising the absorption belt according to claim 22 as a means for transferring said printing medium.

24. A method for producing an absorption belt 15 capable of absorbing an object, comprising the steps of:  
(a) forming a first lamination by laminating a feeding terminal layer sheet and an absorption layer sheet over an electrode sheet and laminating an under-electrode layer sheet under said electrode sheet;

20 (b) forming a second lamination by laminating said absorption layer sheet over said electrode sheet and laminating said feeding terminal layer sheet and said under-electrode layer sheet under said electrode sheet;

(c) providing an insulating layer sheet having a 25 plurality of openings and alternately disposing said first lamination formed in step (a) and said second lamination formed in step (b) in said openings of said insulating layer

sheet;

(d) winding said insulating layer sheet on a core member so that the both ends of said insulating layer sheet overlap with each other;

5 (e) covering a circumferential surface of said insulating layer sheet with a cylindrical member; and

(f) thermally joining adjacent sheets and said overlapped portions.

10 25. An absorption belt capable of absorbing an object, comprising:

a base layer;

an insulating layer on said base layer;

a plurality of electrodes arranged alternately with  
15 positive and negative with respect to said insulating layer;  
and

a plurality of layers for covering each of said electrodes, at least two of said layers having different volume resistivities.

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26. The absorption belt according to claim 25, wherein volume resistivities of said plurality of layers disposed on each of said electrodes are set to decrease in accordance with a distance from each of said electrodes.

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